

CLAIMS

1. A semiconductor device comprising:

5 a die-pad including a first surface and a second surface opposite to the first surface, the second surface including an exposed portion and a retreated portion around the exposed portion;

a semiconductor chip mounted on the first surface of the die-pad; and

10 a sealing resin covering the die-pad and the semiconductor chip, the resin allowing the exposed portion to be exposed and being held in contact with the retreated portion.

2. The semiconductor device according to claim 1, wherein the
15 retreated portion is defined by a retreated surface and a side surface which adjoins the exposed portion and forms an acute angle together with the retreated surface.

3. The semiconductor device according to claim 1, wherein the
20 die-pad is formed with a slit that is opened in the retreated surface of the second surface and in the first surface.

4. The semiconductor device according to claim 1, wherein the
25 die-pad is formed with a plurality of slits that are opened in the retreated surface of the second surface and in the first surface, the plurality of slits being arranged to surround the semiconductor chip.

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5. The semiconductor device according to claim 3, wherein the semiconductor chip is electrically connected to the die-pad via a first wire, the first wire being connected to the first surface of the die-pad at a portion between a peripheral edge
5 of the die-pad and the slit.

6. The semiconductor device according to claim 1, further comprising a terminal electrically connected to the semiconductor chip via a second wire, the terminal being retained
10 by the sealing resin so as to be partially exposed.

7. A semiconductor device comprising: a semiconductor chip; a die-pad including an upper surface on which the semiconductor chip is mounted and a lower surface opposite to the first surface,
15 the die-pad being electrically connected to the semiconductor chip via a first wire; a plurality of leads electrically connected to the semiconductor chip via second wires; and a sealing resin enclosing the semiconductor chip in a manner such that the lower surface of the die-pad is exposed;

20 wherein the die-pad includes a thin-walled portion formed by removing a part of the lower surface along a peripheral edge of the die-pad, the die-pad being formed with at least one slit extending through the thin-walled portion.

25 8. The semiconductor device according to claim 7, wherein the sealing resin extends under the thin-walled portion so as not to expose an opening of the slit.

9. The semiconductor device according to claim 8, wherein the slit extends along a side surface of the semiconductor chip around the semiconductor chip.

5 10. The semiconductor device according to claim 8, wherein the first wire is connected at one end thereof to the semiconductor chip and connected at another end thereof to the die-pad at a portion between a peripheral edge of the die-pad and the slit.

10 11. A method of making a semiconductor device comprising the steps of:

punching a conductive frame to form a die-pad with a slit, the die-pad including an upper surface and a lower surface opposite to the upper surface, the slit extending through the die-pad at a location adjacent to a peripheral edge of the die-pad;

etching the lower surface along the peripheral edge of the die-pad so as to form a thin-walled portion in the die-pad in a manner such that the slit is opened at the thin-walled portion;

20 mounting a semiconductor chip on the upper surface of the die-pad;

bonding a wire to the semiconductor chip and to the die-pad; and

sealing the semiconductor chip with a sealing resin in a manner such that the lower surface of the die-pad is exposed.